

Claims

1. A fuel injection device (20) for an internal combustion engine, having a housing (30) and a first valve element (34), which has a first hydraulic control surface (73) acting in the closing direction, and having at least one second valve element (36), which has a second hydraulic control surface (75) acting in the closing direction; each valve element (34, 36) is associated with its own hydraulic control chamber (72, 74), which is capable of being connected to a shared high-pressure connection (24) and is at least partially delimited by a respective hydraulic control surface (73, 75), and there is a fluid connection (68b) between the control chambers (72, 74), characterized in that it includes a valve device (77) that is able to disconnect the fluid connection (68b).
2. The fuel injection device (20) according to claim 1, characterized in that at least two valve elements (34, 36) are situated coaxially, the control chamber (72) associated with the inner valve element (34) and the fluid connection (68b) are situated in an end section (62) of the outer valve element (36), and the valve device (77) has a pin-shaped, preferably conical valve member (73b) on the inner valve element (34), which, in an open end position of the inner valve element (34), at least approximately closes the mouth of the fluid connection (68b) into the inner control chamber (72).
3. The fuel injection device (20) according to claim 2, characterized in that the hydraulic control surface (73) of the inner valve element (34) is conical as a whole and thus constitutes the valve member of the valve device (77).

4. The fuel injection device (20) according to one of claims 2 or 3, characterized in that the end segment of the outer valve element (36) has a separate cylindrical part (62) containing a central, stepped through bore (68).
5. The fuel injection device (20) according to claim 1, characterized in that the fluid connection (68b) extends approximately in the radial direction and the valve device (77) has a valve edge (73b) on a valve element (34) functioning as a slide valve, which, in an open end position of this valve element (34), at least approximately covers the mouth of the fluid connection (68b).
6. The fuel injection device (20) according to one of the preceding claims, characterized in that the fluid connection (68b) has a flow throttle.
7. The fuel injection device (20) according to one of the preceding claims, characterized in that one valve element (36) has a driving segment (62b) that rests against the other valve element (34) at least at the beginning of the closing process.
8. The fuel injection device (20) according to one of the preceding claims, characterized in that the control surfaces (73, 75) are dimensioned so that when the pressure in the control chamber (74) associated with the outer valve element (36) is increased further, before the inner valve element (34) has moved into its open end position in which it closes the fluid connection (68b), the inner valve element (34) closes before the outer valve element (36) and the hydraulic force, which acts on the effective control surface (73b) of the inner valve

element (34) when the valve device (77) is closed and when the maximum pressure prevails in the control chamber (74) associated with the outer valve element (36), is sufficient to move the inner valve element (34) in the closing direction as soon as the outer valve element (36) has reached its closed position.